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Geographic export diversification: determinants and their link with export performance

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Abstract:

This study examines company-specific factors that may help explain the choice of an export market strategy and explores how the selected export strategy contributes to explaining company's export performance. Concentrating on a specific area within a broad spectrum of export behaviour analysis has enabled us to examine these factors in greater depth. The results of our research, which was carried out using a sample comprising Spanish exporting companies, show that a firm's size, a firm's age and greater foreign ownership in its share capital are all determining factors for adopting a strategy geared to export market diversification. A greater level of investment in R&D and greater international commitment are also important in this regard. We suggest reinforcing these two factors because there is evidence of better export performance among firms that have a wider range of foreign markets.

Keywords: geographic export diversification; export performance; export intensity; Spanish exporters; international marketing; export market expansion strategies.

1. Introduction

Export behaviour has traditionally been analysed using variables that explain the decision to export, including, notably, export intensity, internationalisation process stages and market entry modes.

However, research that also covers other general aspects, such as those related to export market expansion, is less common, despite the growing interest in the determining factors of firms' export behaviour, as the ample (though heterogeneous and fragmented) literature thereon demonstrates.

After the decision to actually undertake export activities, choosing a foreign market expansion strategy is one of the key decisions that a firm must make during its internationalisation process (Cavusgil & Zou, 1994). From the perspective of international marketing, such a decision, when made on a long-term basis, requires a firm to i) define the characteristics sought in the markets in question (Albaum, Strandskov, & Duerr, 2002); ii) identify potential markets beforehand, analyse them and establish the order in which it will enter them (Ayal & Zif, 1979); iii) determine the number of foreign markets in which it will compete or operate (Albaum et al., 2002), bearing in mind the restriction of a fixed marketing budget that must be shared among the different markets chosen (Ayal & Zif, 1979); and iv) determine the pace of its international expansion (Ayal & Zif, 1979).

Another topic that has generated considerable interest among researchers is the study of the factors that influence a firm's export performance. In that respect, some works conclude that a firm's success in foreign markets is conditioned by various aspects, including export activity planning and organisation, the firm's export commitment, managerial capabilities, the extent of the firm's international orientation, the adaptation of marketing, and good relations with foreign distributors and middlemen (Navarro, 2002). Other studies deem foreign expansion strategies to be determining factors in export performance but also confirm that their status as such is debatable.

In that context, some research affirms that an export market concentration strategy produces better export performance (e.g., Bodur, 1994; Beamish, Craig, & McLellan, 1993; Madsen, 1989), though a larger number of studies shows that there is a positive association between such performance and geographic diversification strategy (e.g., Aulakh, Kotabe, & Teege, 2000; Lee & Yang, 1990; Naidu & Prasad, 1994). Meanwhile, a third group of authors believe that there is no significant relationship between the variables (e.g., Katsikeas, Piercy, & Ioannidis, 1996; Lee & Yang, 1990; Ruzo, Losada, Navarro, & Díez, 2011)¹. This fierce debate on the subject has attracted the attention of many researchers, who have contributed a plethora of empirical writings.

The first aim of this study was to determine whether some characteristics identify the group of exporting companies with a greater tendency to diversify its export sales. The second objective was to study whether better export performance or worse performance can be attributed to this greater diversification.

¹ In the case of the last two viewpoints (positive relationship and no relationship), there are discrepancies in the findings of some studies because a multidimensional approach was used to evaluate export performance.

This paper made the following major contributions. Our first contribution was to jointly analyse several factors that are determinants in the export market expansion strategy, which have been partially treated by different theoretical and empirical investigation on the subject. Second, in the process of depicting the international diversification–export performance relationship of firms, we sought to apply these hypotheses in a new setting. Thus, we focused on determining whether the export market strategy followed by the company is related to export performance and to determine whether there is a more appropriate strategy. If there was a better strategy, we attempted to identify the conditions for greater export performance. Specifically, this study seeks to answer the two following interrelated questions: (1) in what ways do exporting companies with a greater tendency to diversify their export sales differ from those that follow an alternative approach? (2) How is the firm's international diversification related to their export success?

In choosing the factors, we took the characteristics used to differentiate the companies according to the export market expansion strategy in theoretical studies on the subject, focusing on factors related to the company's internal characteristics according to the variables available in the database used.

In this framework, we intend to continue advancing our knowledge of the internationalisation of Spanish companies, which would allow us to delve into the characteristics that are typical in an economy. Our empirical approach is based on a sample of Spanish exporting firms, collected from the ESEE² (*Encuesta sobre Estrategias Empresariales*), which includes firms of very different sizes. Studies including firms with a wide range of sizes are rare (Alonso & Donoso, 1998; Bilkey & Tesar, 1977; Bonaccorsi, 1992; Cavusgil, 1984). Interestingly, almost the entire literature on international diversification focuses on multinational corporations (MNCs). This is especially important as there are virtually no empirical studies that have simultaneously examined the export behaviour in a single sample of large firms and SMEs³ (Benito-Osorio, Colino, Guerras-Martín, & Zúñiga-Vicente, 2016). Moreover, taking into account the SMEs make a major contribution to an economy in terms of both employment and gross value added⁴.

This paper is structured as follows. The second section focuses on the traditional explanations of international expansion strategies and thereafter develops the working hypotheses. The methodology and statistical analysis are then explained. The last section offers a discussion of the results, consisting of the main conclusions reached, practical implications and some guidelines for future research on the subject.

² The survey arose from an agreement that Spain's Ministry of Industry, Energy and Tourism (then the Ministry of Industry and Energy) and the SEPI Foundation (a state-owned industrial holding corporation previously known as the *Fundación Empresa Pública*).

³ This study also differentiates between small and medium firms within the SMEs.

⁴ SMEs are the backbone of Europe's economy. In the past five years, they have created around 85% of new jobs and provided two-thirds of the total private sector employment in the EU (European Commission, 2016).

2. Theory and hypotheses

2.1. Concentration vs Diversification

Depending on the number of markets where a firm is looking to establish its presence, two alternative strategies have been identified and discussed: concentration and diversification (e.g., Ayal & Zif, 1979; Lee & Yang, 1990; Losada, Ruzo, Barreiro, & Navarro, 2007; Mas, Nicolau, & Ruiz, 2006), which are also referred to as concentration and dispersion/spreading (e.g., Crick, Chaudhr, & Batstone, 2000; Piercy, 1981b; Katsikeas & Leonidou, 1996; Katsikea, Theodosiou, Morgan, & Papavassiliou, 2005).

There is a lack of consensus regarding the foreign market expansion strategies a firm should adopt to improve its chances of success. To address this issue, three groups of contradictory studies have been identified (Katsikeas & Leonidou, 1996). One group of authors (Bodur, 1994; Madsen, 1989) recommends the concentration strategy for foreign expansion purposes. They argue that focusing on a relatively small number of key markets enables exporting companies to secure a larger market share or achieve a high level of penetration – which, in turn, is associated with greater long-term profits – to reduce the administrative and transaction costs that sales entail, to avoid the dispersion of their marketing efforts and assign resources efficiently, and to pave the way for more in-depth knowledge of the specific characteristics of their chosen markets and the consumers who are part of them.

In contrast, other authors (e.g., Aulakh et al., 2000; Beamish et al. 1993; Lee & Yang, 1990; Piercy, 1981a,c) advocate a market diversification strategy. They argue that foreign market expansion into multiple countries, which involves small shares of highly dispersed markets, may reduce the risk of foreign operations as a result of the diversification of investments, result in greater market coverage, pave the way for greater economies of scale, allow firms greater operational flexibility due to them being less dependent on just one or several markets, and enable organisations to achieve their desired level of international growth, which is more beneficial than concentrating on a small number of key markets.

A third group of authors (e.g., Aulakh et al., 2000; Ayal & Zif, 1979; Brouthers & Nakos, 2005; Katsikea et al., 2005; Madsen, 1989; Piercy, 1981b; 1982) favours an approach that sits somewhere between the aforementioned traditional strategies. They feel that the suitability of a given export market expansion strategy depends on various situational and sector-related factors, such as the specific factors corresponding to the firm, the product, the market and the marketing involved (Piercy, 1981b).

2.2. Factors influencing export market expansion strategies

With a view to identifying the range of internal factors that influence a firm's international expansion strategy, we established various hypotheses related to the firm's specific characteristics, product factors and marketing factors. Though the literature has focused on analysing firms' internal and

external factors as determinants of export behaviour, less importance has been attributed to the latter type. All firms operating in a similar environment encounter similar external factors, a situation over which they have relatively little control (Zou & Stan, 1998).

The conclusions stemming from the main studies on export behaviour, which revolve around export market expansion strategies and are complemented by other measurements regularly used in internationalisation, allow us to formulate a hypotheses about the relationships to be studied.

2.2.1. Firm Factors

The extent to which firms collaborate, analysed in the context of the network approach (Mitchell, 1969; Tichy, 1981; Weiman, 1989), means that markets constitute networks of inter-organisational ties in such a way that the degree of internationalisation of a firm's network has significant implications where its internationalisation process is concerned. From this point of view, interaction between the firm's competitive advantages and those of the business group to which it belongs conditions its internationalisation process, which is aided by the accumulated knowledge and experience within the network (Martín Armario, 2004).

The degree to which organisations collaborate has been identified as a firm-related characteristic that has a bearing on the export market expansion strategy adopted (Losada et al., 2007; Navarro, 2002), just as having foreign shareholders is conducive to a firm's internationalisation (Requena, 2005).

Being better positioned in terms of access to new production and administrative techniques developed by their parent companies means that firms tend to incur lower costs when launching new products or becoming involved in new markets (Castillo & Requena, 2003). The same authors find that foreign ownership in the share capital of Spanish companies makes them more likely to diversify where foreign markets are concerned. To test this hypothesis we propose the following:

Hypothesis 1: *Greater involvement of foreign capital in a firm is likely to lead to greater export market diversification.*

2.2.2. Product factors

Investment in R&D has been identified as a variable that encompasses product innovation. In that regard, the company's R&D resources is often associated with greater internal development of both product and process technology (Menon & Pfeffer, 2003). For example, firms operating in high-technology industries have a large proportion of their resources committed to their products and process (Elango, 2012).

The intensity of R&D is related with the sector's technological intensity (Arbussà, Bikfalvi, & Valls, 2004). A sector's technological intensity is also considered a determining factor in the internationalisation process (e.g. Pla & Escribá-Esteve, 2006), in that firms that are more technologically advanced are more involved in international markets (Caves, 2007). Based on the

classification system of the OECD, high-technology industries have a high R&D intensity relative to production value (Elango, 2012).

R&D intensity is the most common proxy used to denote the existence of internationalization advantages, implying that high degree of R&D intensity indicate the presence of intangible assets that lead to competitive advantage in international markets (Kirca et al., 2011).

According to Elango (2012), his study “offers clear justification of the benefits of internationalization for firms in technology-intensive industries and supports the benefits of internationalization argued in the literature.”

Concentrating on our stated aim, when a firm introduces valuable innovative goods or services, competitors will try to duplicate the innovations. Innovators must enter various markets simultaneously to reap the first mover advantage and deter imitators (Mathews & Zander, 2007). Also, firms prioritise export market diversification when they tend to specialise and where markets are not large enough for more intensive penetration (Piercy, 1981b). Furthermore, firms that operate in an R&D-intensive industry are more likely to segment their specialisation in different markets (Castillo & Requena, 2003). At the same time, international diversification can help firm's to generate resources for highly R&D investments (Hitt et al., 1997). And Kirca et al. (2011) find that R&D intensity has positive effects on firm multinationality. In view of this, we proposed the following hypothesis:

Hypothesis 2: *Greater investment in R&D is likely to lead to greater export market diversification.*

2.2.3. Marketing factors

The extensive literature on internationalisation includes attempts to identify marketing factors that influence firms' export success (e.g., Leonidou, Katsikeas, & Saimee, 2002), although the results have not always been overly conclusive (Aaby & Slater, 1989).

International distribution strategy, it should be noted, is highly related to the form of access chosen by a firm. As far as SMEs are concerned, it could even be said that their foreign market entry mode ultimately determines the distribution strategy they will follow (Garcia Cruz, 2000). The numerous foreign market entry options open to a firm make studying the phenomenon of internationalisation complicated (Coviello & McAuley, 1999). Given the wide range of classifications (e.g., Calderón et al., 2007; Hill, Hwang, & Kim, 1990; Pan & Tse, 2000; Rialp, Axinn & Thach, 2002), in our study, we opted to follow the “hierarchical model” (Pan & Tse, 2000)⁵ because this model makes it possible to distinguish between the main approaches that a firm may take: foreign investment and exporting (direct, indirect or concerted). In keeping with the model, direct exports are regarded as consisting solely of those carried out through commercial agents or distributors in target markets, excluding entry modes that require foreign investment (sales subsidiaries or branches), which

⁵ In the model proposed by Pan and Tse (2000), entry modes are divided into two main groups, namely those that do not require foreign investment (exporting, in its different forms, and contractual agreements) and those that do (own subsidiaries and joint ventures, whether they are sales or production-oriented).

is in contrast to other classifications. Though both approaches entail greater control than other options, the extent of that control varies depending on the form chosen.

Foreign direct investment (FDI), whether through sales or production-oriented subsidiaries, represents the maximum level of international commitment (Pla, 1999; Rienda, 2005), whereas a direct export mode involves a relatively high level of commitment. Direct export is analysed in the context of the different options available with regard to exporting. Both entry modes entail a firm's direct involvement in managing target market sales and, thus, an active approach to international marketing. Katsikea et al. (2005), meanwhile, point to taking an active approach to marketing in foreign markets as a distinguishing trait of diversification strategies.

Diversification strategy has been suggested as one of the dominant reasons for foreign direct investment (FDI) (Denis, Denis, & Yost, 2002; Markides & Ittner, 1994). It is argued that international investments abroad not only provide access to important resources, but also allow firms an opportunity to reduce the costs and risks of entering into new foreign markets (Boateng & Glaister, 2003).

Boateng, Qian and Tianle (2008), conclude that FDI by Chinese firms are not motivated by a single reason but by a set of multiple motives. The most important motive is to facilitate international expansion and diversification⁶, providing support for the survey findings reported by KPMG Management Consulting (1997/1998) in which "to increase market share" and new presence in other geographical areas were identified as the most important motives for FDI in Europe.

Along this line, we hypothesised the following:

Hypothesis 3: *Setting up foreign subsidiaries is likely to lead to greater export market diversification.*

With regard to international communication strategy, there is consensus in the literature with regard to the relevance of communication tools as a determining factor of export success, something that various authors have confirmed (Amine & Cavusgil, 1986; Jovell, 2007; Kirpalani & McIntosh, 1980; Merino & Moreno, 1996; Yaprak, 1985). Communication improves the image of a firm's products, making it possible to distinguish them from those of its competitors in international markets (Leonidou et al., 2002).

Other findings suggest that the value of advertising intensity depreciates when applied to multiple markets, and the exploitation of these assets does not necessarily enhance performance the scope of their use in the same firm (Kirca et al., 2011). Furthermore, a number of studies include the degree to which firms adapt their communication as a distinguishing factor in relation to export market expansion strategies (Ayal & Zif, 1979; Katsikea et al., 2005; Mas et al., 2006; Piercy, 1981b). In any event, we proposed the following:

⁶ Other reasons are: to acquire strategic assets, including technology, research and development capabilities, and other management know-how.

Hypothesis 4: *Greater investment in communication activities is likely to lead to greater export market diversification.*

2.3. Relationship between export performance and export market diversification

Though the foreign expansion strategy is a determinant of export performance, empirical studies that have tested this relationship have confirmed what is questionable about the options considered (Brouthers & Nakos, 2005; Katsikea et al., 2005; Lee & Yang, 1990; Mas et al., 2006; Ruzo et al., 2011). A firm's export market expansion strategy may be considered a determining factor of its export performance, but there is neither theoretical nor empirical consensus as to which type of strategy results in better export performance (Lee & Yang, 1990).

The possible causes of that lack of consensus are, first, heterogeneity in firms' contingency factors, which makes it difficult to recommend a single expansion strategy for all types of situations (see section 2.2); second, diversity in terms of the criteria used for strategy classification, with precedence given to individual criteria; and, last, the lack of uniformity where export performance measurements are concerned.

As far as the second of these causes is concerned, some research has primarily focused on finding a systematic, objective process through which an organisation's foreign market expansion strategy can be classified as either concentration or diversification. There are two major approaches in that regard; the first is based on individual criteria, and the second focuses on the multiple dimensions of such a strategy.

Simply considering the country count (the individual criterion used most frequently) (e.g., Alonso & Donoso, 1998; Aulakh et al., 2000; Bradley & O'Reagain, 1998; Dejo & Ramírez, 2009; Denis & Delpeteau, 1985; Piercy, 1981c) is insufficient for identifying a firm's expansion strategy because plenty of firms that export to many countries focus their efforts and concentrate on just a handful of markets (Crick et al., 2000; Katsikeas & Leonidou, 1996; Katsikea et al., 2005; Piercy, 1981b). Distinguishing between concentration and diversification based on the criterion in question may be conceptually straightforward, but in practice, it is no easy task, primarily because of the difficulty involved in determining the number of markets representing the cut-off point between one strategy and the other. Thus, other authors (Lee & Yang, 1990; Mas et al., 2006; Ruzo et al., 2011) have proposed three aspects as a basis for distinguishing between the two types of strategy, namely export experience, number of export markets and the marketing effort a firm allocates to its main export markets.

In a broad conception, measurements of geographic diversification can be qualitative in nature (concentration strategy vs diversification strategy), as just defined, or they can be based on quantitative measures (Suárez, Olivares, & Galván, 2002), as the entropy to measure international diversity. The first indices stem from the *Herfindahl* index and *Jacquemin & Berry* index. The entropy measure was originally created by Jacquemin & Berry (1979) to capture the relation between

corporate diversification and growth. Since then, several measures for international diversification and regional classification have been operationalised in previous studies (Alonso & Donoso, 1998; Geringer, Tallman, & Olsen, 2000; Hitt, Hoskisson, & Kim, 1997; Li & Qian, 2005).

The third factor that restricts the consensus in which the strategies lead to better export performance, is the lack of uniformity in measures for a firm's export performance. Organisational performance is the central object of study in a wealth of international business literature, but there is a lack of consensus regarding the conceptual and operational definition of a firm's export performance (Katsikeas, Leonidou, & Morgan, 2000; Shoham, 1998). A range of different measurements are used to evaluate export performance (Morgan, Katsikeas, & Vorhies, 2012), leading to inconsistent, contradictory results. This, in turn, gives rise to complications in terms of drawing comparisons between studies that use different measurements and generalising in relation to their conclusions (Styles, 1998; Zou & Stan, 1998).

Hence, the relationship between performance and the diversification of export markets may be more complex than postulated in empirical settings (Mathur et al., 2004), and the source of so much divergence is abundant. Many empirical studies assumed that the greater the degree of geographic diversification, the higher performance will be. This assumption leads to argue a linear and positive link, (e.g. Aggarwal, 1979; Chao, Kim, Zhao, & Hsu, 2012; Grant, 1987). In a smaller manner, there are still approaches that have found linear negative in the relationship (e.g., Brewer, 1981; Geringer et al., 2000; Kotabe et al., 2002). These scholars suggest that as the number of foreign countries in which a firm operates increases, international expansion can be expected to begin yielding incremental costs that exceed the firm's incremental benefits (Benito-Osorio, et al., 2016).

But, several authors began to empirically identify a non-linear international diversification–performance link. Two alternative curvilinear models (quadratic relation) have been formulated: the U-shaped model (e.g., Contractor, Kistruck et al., 2013; Kundu, & Hsu, 2003) and the inverted U-shaped model (e.g., Elango, 2006; Hitt et al., 1997). The first suggests an initially negative effect of geographic diversification on performance before the positive returns of international diversification become available. And the second pattern, an inverted U-shaped, means that must be thresholds of internationalization. As a result of the transaction costs and processing demands, the costs of international diversification will sometimes exceed the benefits of the diversification.

However, as noted by Contractor (2007), the results of over one hundred empirical studies over the past 30 years appear, on superficial examination, to be contradictory, but can be reconciled by S-shaped general theory. This approach assumes that a firm's evolution abroad can be depicted through three stages sigmoid curve.

Therefore, having identified the factors that can affect a firm adopting a strategy of diversification in foreign markets, the next step is to test how international diversification is related with a company's export performance, as shown in Figure 1. As Chao et al. (2012), this article did not argue for a

specific shape of the curve depicting the international diversity–firm performance. We proposed the following hypotheses:

Hypothesis 5a: *The relationship between geographic export diversification and export performance follows a linear pattern with positive slope.*

Hypothesis 5b: *The relationship between geographic export diversification and export performance follows a curvilinear pattern:-*

Hypothesis 5c: *The relationship between geographic export diversification and export performance follows a cubic pattern.*

‘Insert Figure 1 here’

3. Methodology

The methodology used in this study was divided into two parts: a binomial logistic regression analysis (for Hypotheses 1-4) and White’s test to test the last hypothesis (H5).

3.1. Sample

To test the hypotheses set out above, we used data obtained from the ESEE⁷ sample, a statistical survey that collects data from an annual business survey sent to a panel of Spanish manufacturing companies regarding various aspects related to their strategic behaviour and decision-making. The survey in question includes information on aspects omitted by other statistics but deemed relevant for obtaining a comprehensive picture of Spain's industrial situation. This survey contains information about markets, customers, products, employment, trade and technological activity.

We felt it necessary to analyse the export behaviour of a sample of firms of different sizes. In that regard, the ESEE’s population of reference is composed of Spain’s manufacturing industry with 10 or more employees within the different sizes (encompassing small and medium-sized enterprises (SMEs) and large companies alike). One of the most relevant characteristics of the ESEE is its representativeness. The initial selection was carried out combining exhaustiveness and random sampling criteria. Those firms with more than 200 employees were included in the first category. The second category was composed by firms employing 10 to 200 workers. These firms were selected through a stratified, proportional and systematic sampling with a random seed.

The sample for the year we analysed, 2009, comprises 1,300 Spanish exporting companies. This sample includes firms of very different sizes (small, medium and large firms), even though there is a large proportion of SMEs (74.5%). Medium-sized firms (≥ 50 and < 250 employees) make up almost half our chosen sample (40.8%), whereas small firms (≥ 10 and < 50 employees) accounted for 33.7% and large companies (≥ 250 employees) 25.5%. Our classifications are based on Recommendation 2003/361/EC concerning the definition of micro, small and medium-sized enterprises.

⁷ <https://www.fundacionsepi.es/investigacion/esee/en/spresentacion.asp>

In terms of export distribution, grouping target markets into geographic areas to simplify analysis revealed that virtually all Spanish exporting companies in the sample export to European Union (EU) countries, which constitute their main target market due to geographical, cultural and socio-economic proximity. Even taking into account the fact that 37%, 52% and 52% of the firms export to emerging markets in Latin America, further-away advanced post-industrial countries in the OECD (Australia, Canada, Iceland, Japan, Mexico, New Zealand, Norway, Switzerland, Turkey and the USA) and the rest of the world (all countries not included in the other areas), respectively, the proportion of exports corresponding to each of these three geographic areas (which are as defined in the “ESEE”) is much smaller than that corresponding to EU countries, which stands at 69.2% in comparison to 4.5% (emerging markets in Latin America), 9.1% (further-away advanced post-industrial countries in the OECD) and 15.1% (the rest of the world), respectively.

Data from Spain's Tax Administration Agency's Customs Department paint a similar picture, i.e., an excessive bias, towards exporting to EU countries (a share of approximately 70%), particularly those of the EU-15, showing a marked geographic concentration of Spain's foreign trade. Nonetheless, over the last few years, there has been a slow but steady fall in the share corresponding to the EU and a rise in the proportions corresponding to other geographic areas, notably countries in Africa (South Africa, Tunisia, Algeria and Morocco), Asia (China), Latin America (Brazil) and the rest of Europe (Switzerland).

3.2. Variables

3.2.1. Export Intensity

Export intensity is defined as the ratio of a firm's export sales to its total sales (Cavusgil, 1984). This variable was incorporated in the second part of our analysis⁸.

According to the variables available in our research (ESEE), and following other authors (Cavusgil, 1984; Beamish et al., 1993; Eusebio, 2001; Jovell, 2007; Lee & Yang, 1990), this variable is most suitable for use as a financial measurement for evaluating export performance, although it can also serve as a complementary measurement of export commitment (Alonso & Donoso, 2000; Rienda, 2005; Rialp, 1997;), or it can be used as a measurement of a firm's degree of internationalisation (Calderón et al., 2007; Castillo & Requena, 2003; Fernández & Nieto, 2005).

3.2.2. Geographic Diversification Index

According to the systems established for classifying a firm's foreign expansion strategy (e.g., Katsikea et al., 2005; Lee & Yang, 1990; Ruzo et al., 2011; Suárez et al., 2002), based on the data available in our research the variables that it would be possible to use are the number of geographic areas or the number of target areas. However, both are limited in that unlike the entropy measure, they do not consider the distribution of sales among the areas under consideration. Prior studies have often used an

⁸ Export intensity (XP): sample mean = 31.674; S.D.(standard deviation) = 28.718

entropy measure to proxy for international diversification (Aulakh et al., 2000; Chang & Wang, 2007; Qian, Khoury, Peng, & Qian, 2010; Pan & Tsai, 2012), and this study followed that lead. We group foreign markets into four regions based on economic and political conditions (defined in the “ESEE”): EU, further-away advanced post-industrial countries in the OECD, emerging markets in Latin America and the rest of the world. Although not perfect, this approach allows us to focus on between-market heterogeneity (Kim et al., 1989).

For this research, we measure international diversification using the Geographic Diversification Index, the entropy measure suggested by Alonso and Donoso (1994, 1998), which uses a ranking from 0 to 1 and is similar to the Herfindahl index. Following the empirical concept, geographic diversification is defined as follows:

$$GDI [0,1] = \frac{-\sum_{i=1}^n p_i \ln(p_i)}{\ln(n)}, i = 1 \dots, n$$

where p_i is the share of a firm's sales, in units, to the i^{th} geographic area as a proportion of its total overseas sales. n expresses the total number of geographic areas¹⁰. This measure accurately reflects the level of a firm's geographic diversification, as it considers both the number of geographic areas in which it operates as well as the weight of each area relative to the firm's sales (Hitt et al., 1997; Wiersema & Bowen, 2008).

A firm might export to the four geographic areas established but have the vast majority of its sales concentrated in one of them (e.g., the EU-27) and the rest distributed among the others in very small proportions. Maximum diversification, conversely, would occur in the case of a firm operating with similar shares in all the geographic areas under consideration.

The index's maximum value, 1, which represents maximum diversification, corresponds to a firm operating with equal shares in all of the geographic areas under consideration, meaning that $p_i = 1/n$ for all of i . The minimum value, 0, which represents maximum concentration, corresponds to a firm that makes its sales in a single geographic area, in which case $p_j = 1$ and $p_i = 0$ for all of i other than j (j being any area different than i).

Based on the GDI¹¹, we use dichotomous GDI to classify companies into two groups with distinguishing traits, according to their greater or lesser degree of geographic diversification. Thus, the sample must be separated into two groups and obtain the dependent variable of our research's first and main confirmatory analysis, a variable that we call the Binary GDI.

Group one ($GDI > \text{sample mean}$) contains those firms (50.92% of the sample) whose approach is geared towards export market diversification and the mean GDI within this group ~~one~~ is 0.56. Group two ($GDI \leq \text{sample mean}$) contains those firms (49.08% of the sample) whose approach is geared towards export market concentration and its mean GDI.

⁹ i indexes the geographic areas: EU countries, emerging markets in Latin America, further-away advanced post-industrial countries in the OECD and the rest of the world.

¹⁰ To calculate the index, Alonso & Donoso (1994, 1998) add the domestic market to the areas in question.

¹¹ Sample mean GDI = 0.350; S.D.(standard deviation) = 0.244

3.2.3. Independent variables of the first analysis

a) Firm factors

This section includes foreign ownership in the Spanish exporting firm's shareholder composition. In the information of the "ESEE" this variable is measured as the total percentage of stock held by foreign shareholders and reflects both direct and indirect ownership in the Spanish company's share capital; it is a quantitative variable that takes values of 0% (when the firm's share capital is exclusively national) to 100%.

b) Product factors

Investment in R&D has been incorporated as a quantitative variable. It is measured by the firm's R&D expenditure as a percentage of its overall revenue.

c) Marketing factors

This group focuses on distribution strategy and communication activities. The first, which is associated with the foreign market entry mode chosen by a firm, is represented by a quantitative variable – number of foreign subsidiaries – given that it will be firms with FDIs that will obtain the maximum degree of international commitment. The entry mode by direct exports through sales agents or distributors will also involve a greater commitment than other entry modes by means of export but less than setting up abroad.

Expenditures on advertising, promotion and public relations as a percentage of overall revenue is used as a measure of communication activities – advertising intensity – and is thus a quantitative variable.

3.2.4. Control variables

The first analysis considers the following control variables that influence a firm's international diversification: size measured as a categorical variable that takes a value from 1 to 3, with 1 corresponding to 'small firm', 2 corresponding to 'medium firm' and 3 corresponding to 'large firm' according to the criterion traditionally applied in Spain, that is, Recommendation 2003/361/EC (in this recommendation firms can also be classified by turnover); and the age of the firm, a quantitative variable measured by number of years since it was founded.

Following López-Cózar-Navarro, Benito-Hernández, & Platero-Jaime (2017), only two control variables were considered in order to mitigate the risk that the resulting sample sizes would be too small, thereby preventing the miscalculation of regression coefficients.

Many authors have used company size to study their relationship with export market diversification (e.g. Calof, 1994; Gómez-Mejía et al., 2010; Losada et al., 2007;). Most of them confirm the existence of a positive relationship between two variables. Small firms are usually more resource-constrained and vulnerable to market competition (Doukas & Lang, 2003), and the likelihood of seeking more familiar markets decreases, in order to reduce the costs related to the need to adapt to the cultures of different countries (Contractor, 2007). However, large firms may incur greater coordination costs,

which may reduce the synergy of diversification (Chang & Wang, 2007). In this respect, Kumar and Sing (2008) support, to some extent, the regional aspect of internationalization of the global Fortune 500 companies (the world's largest firms by revenue) by Rugman and Verbeke (2004), which suggests that even the largest multinationals have cautiously internationalized and most of them have the vast majority of their sales in only one of the three major "triad" regions (North America, Europe, and Asia). Hence, firm size influences a firm's international diversification (Dass, 2000) and its effect on the export behaviour of international diversification is ambiguous.

Age is another firm-related variable that is considered to be a factor affecting an organisation's internationalisation process. Some studies also included this variable as a control variable to explain the growth strategies of companies (Barbero, Casillas, & Barringer, 2012). As company age is directly related to its size, the relationship between export market diversification and company age is expected to be positive (López-Cózar-Navarro, et al. 2017).

3.3. Modelling

With a view to identifying in what way and how strongly the explanatory factors influence firms to adopt a greater degree of export market diversification (Hypotheses 1-4), we carried out a binomial logistic regression analysis¹², a technique used in other studies on the internationalisation process in companies (Brouthers, 2013; Cowan, Huang, & Padmanabhan, 2016; Geringer, Beamish, & Dacosta, 1989; Naidu & Prasad, 1994; Pla & Escribá-Esteve, 2006), and adapted further in our study (we are interested in ranking firms according to the above factors in one of the two groups defined by the dependent variable; an explanatory variable included in the model is qualitative). Thus, this technique is well suited for the case in hand, where the phenomenon to be explained can only be measured as [0/1] alternatives.

In the context in question, the Binary GDI variable takes a value of 1 when the company tends towards greater geographic diversification and 0 in the alternative approach. The qualitative explanatory or independent variable¹³ that we used to test some of the hypotheses corresponding to the first analysis had to be altered in dummy variables to be included in a binomial logit model. The other explanatory variables, which are quantitative, did not require any alteration.

To test our final hypothesis (Hypothesis 5), we put forward a model that relates export intensity (a continuous variable measured as a percentage), as an export performance measurement, with the GDI (a continuous variable, from 0 to 1) based on the White's test.

¹² Additionally, a multiple regression analysis was also carried out, with continuous GDI as a dependent variable. See the results in Table 3 (Model 4).

¹³ The dichotomous variables thus became dummy variables, with a value of 1 indicating the attribute's presence and a value of 0 its absence. n-1 dummy variables were created for the categorical variables, with the excluded category serving as the reference category.

4. Analysis of results

4.1. Descriptive analysis

This section presents two descriptive analyses related to the variables of the first analysis.

Table 1 shows the frequency and/or the mean of the independent variables of the first analysis of this research for each of the two groups in which the sample was divided according to their greater or lesser degree of geographic diversification.

According to the data in the table above, almost half of the Spanish firms with an export market diversification approach are medium-sized, a considerably larger proportion than in the case of the group of firms that opt for the alternative approach (35.65%). The most diversified firms have a mean of 34.52 years and a greater level of foreign ownership in their shareholder composition compared with a lower mean for both variables in firms that adopt the alternative approach. The figure that we obtained for the mean investment in R&D as a percentage of sales among firms adopting a market diversification approach is 1.58%, almost twice the level corresponding to firms that opt to concentrate their export sales. And the number of foreign subsidiaries is three times in the Spanish firms with a greater degree of export market diversification.

‘Insert Table 1 here’

To provide more information about the different variables used in this research, Table 2 presents the descriptive statistics and correlation matrix¹⁴ for the dependent, independent and control variables in our first analysis.

‘Insert Table 2 here’

4.2. Determinants of geographic diversification

To test our hypotheses 1-4 we employed a logistic regression analysis, as our dependent variable is a dichotomous categorical variable that can only take two possible values (0 = GDI \leq mean (reference category); 1 = GDI > mean). Our multivariate analysis provides a more precise test of Hypotheses 1-4 than bivariate analysis reported earlier¹⁵.

We estimated three models. Model 1 illustrates the effects of the control variables on the probability of the binary GDI (greater geographic diversification). Model 2 includes the hypothesized independent variables and Model 3 includes all of the variables. Overall, the models present satisfactory indicators of goodness of fit.

As Model 1 is a baseline model that includes only the control variables, the amount of variance explained significantly improves when including predictors in Model 2. Model 3 slightly improves regarding Model 2 (Table 3). The predictor variables are robust, and present similar values and levels of significance in both models.

¹⁴ We checked the correlation matrix because logistic regressions assume a lack of multicollinearity. Low correlation values across the independent and control variables suggest that multicollinearity did not threaten the stability of the results.

¹⁵ Reverse causality does not seem to be an issue in this study.

Thus, in model 3, the value of the *Nagelkerke* R^2 goodness-of-fit indicator was 0.129, similar to the values obtained in other research projects (e.g., Calderón et al., 2007; Vida et al., 2000). We corroborated that conclusion by using the -2Log statistic, which is a maximum likelihood estimation method; the model's predictive capability was again found to be good, with 64.46% of the cases classified correctly, a percentage within the interval corresponding to similar research (e.g., Aulakh & Kotabe, 1997; Brouthers, 2013; Pan & Tse, 2000; Pla & Escribá-Esteve, 2006).

With our estimated model proving to be significant, the values predicted thereby constitute the probabilities of taking the option represented by the value 1 in the dependent variable. The said probabilities follow a logistic model, $\exp(z)/(1+\exp(z))$, where z^{16} is a linear function of the independent variables.

The significant variables, according to the Wald coefficient¹⁷, influence the probability of belonging to the group of exporting companies with a greater degree of export market diversification, which indicates an increase in that probability (positive sign) or in the likelihood of being part of the other group (negative sign).

For each of our hypotheses, the estimated β regression coefficients, their significance and the β exponentials are analysed in detail below, with a view to discussing each specific result¹⁸.

'Insert Table 3 here'

A greater level of foreign ownership in a firm's share capital (H1) increases the probability of the firm adopting a market diversification approach. This validates our hypothesis ($p < 0.001$), with the probability of diversification rising in proportion to the increase in the level of such participation, corroborating the findings of Castillo and Requena (2003).

In our literature review, we indicated that investment in R&D (H2) has also been identified as a determining variable of a firm's export behaviour depending on its foreign expansion strategy ($p < 0.001$). It verified that increasing the level of investment in R&D as a percentage of sales makes export market diversification 1.007 times more likely (β exponential), thus having a positive influence on the dependent variable. The positive relationship between two variables has been found by previous research (Kirca et al., 2011).

Setting up foreign subsidiaries, which stems from the market entry modes that involve a firm's own resources, is statistically significant and positive, ($\beta = 0.083$, $p < 0.001$). In this case, the probability of taking an approach geared towards export market diversification rises in 1.087 times as number of foreign subsidiaries increases. Our results corroborate others obtained in recent studies (Boateng et al., 2008).

Our model's results for Hypothesis 4, which we tested using the variable of expenditures on advertising, promotion and public relations as a percentage of sales, show the corresponding β

¹⁶ $Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n$, where the β coefficients are unknown parameters to be estimated and express probability ratio changes produced by variation in the independent variables (Santesmases, 2009).

¹⁷ Used to test the hypothesis that an individual coefficient is not 0.

¹⁸ A logistic regression analysis without large companies was also carried out, to make sure that they did not bias the results.

coefficient's sign to be negative and statistically significant ($p=0.003$). Thus, the more a firm is required to spend on communication activities, the less likely it is to diversify in terms of export sales; to put it another way, it is more likely to adopt the alternative strategy of concentrating its export sales in one or two geographic areas. Although a significant effect was found, this effect was negative contrary to the positive effect hypothesized. Hence, H4 cannot be validated.

The control variables (firm size and age) had a significant relationship with the dependent variable. The first one, firm size, as categorical variable, positive and significant coefficients imply that the event is more likely than at the reference level. This result shows that medium-sized and large companies are both significant ($p<0.001$), and the sign of the estimated regression coefficient is positive. According to the β exponential, a medium-sized or a large firm is more than twice as likely to adopt a greater degree of export market diversification as a small firm.

In the literature on internationalisation, firm size has been studied extensively as a factor that may influence organisations' decisions on the issue in question. In our literature review, we observed that most studies confirm the existence of a positive relationship between firm size and export market diversification strategy (Castillo & Requena, 2003; López-Cózar-Navarro, et al. 2017; Navarro, 2002; Suárez et al., 2002).

With regard to the second control variable, firm age, is also statistically significant and positive ($\beta = 0.006$, $p=0.024$). Thus, the more the firm age is, the more likely it is to diversify in terms of export sales. This positive relationship has also been found by recent research (López-Cózar-Navarro, et al. 2017).

4.3. Export performance and degree of geographic diversification

The test's results for Hypotheses 5a appear in Table 4. The ordinary multiple regression method uses linear model as the base model. This results support Hypothesis 5a, because degree of geographic diversification (GDI) relates positively to firm export performance (XP) ($\beta = 67.880$; $p = 0.000$). We also estimated square model and cubic model, but squared term (GDI^2) and cubed term (GDI^3) in the models failed to achieve significance, and hence not shown in either Table. Therefore, the hypothesized curvilinear and cubic relationship (H5b and H5c respectively) between degree of geographic diversification and firm export performance does not receive support.

First, using the initial linear regression model¹⁹ with cross-sectional data required correction because of the presence of heteroscedasticity given the non-random distribution of the model's residuals. This led us to try formal tests for heteroscedasticity, with the White's test providing ratification. The p-values of F and the cross-terms were below 0.05, thus formally confirming the presence of heteroscedasticity in the model, at 95%.

¹⁹ Hausman test was applied and determined that the regressor was stochastic.

To correctly adjust the models, given the presence of heteroscedasticity, we used the estimation method of White's test²⁰, an estimation that provides a distribution of residuals based on a normal distribution. We introduced another explanatory variable, the binary GDI, because there were two groups of firms with distinguishing traits (see section Methodology). We thus obtained models that had better goodness of fit and, given a *Durbin-Watson* (DW) coefficient of close to 2, was free from autocorrelation.

Hence, linear model, using only the first order term XP, shows a positive and significant relationship between degree of geographic diversification and export performance. This confirms the fundamental argument that geographic diversification is beneficial. However, after the second order GDP² and third order GDP³ terms are introduced in both models (inverted U-curve and S-curve, respectively), we did not obtain significant results for these terms.

'Insert Table 4 here'

The general estimation we obtained is as follows:

$$XP_i = 2.608 + 67.880 * GDI_i + 11.048 * BGDI_i \quad i = 1 \dots 304$$

where XP_i is firm i 's export intensity, GDI_i is its geographic diversification index, and $BGDI_i$ is its Binary GDI variable, which takes a value of 0 or 1.

The model thus incorporates two structures depending on the differences in the export behaviour of the firms analysed. In the case of a firm with a tendency towards an export market concentration approach (firms group: $GDI \leq \text{mean}$):

$$XP_i = 2.608 + 67.880 * GDI_i$$

Alternatively, in the case of a firm with a tendency towards an export market diversification approach (firms group: $GDI > \text{mean}$):

$$XP_i = 13.656 + 67.880 * GDI_i$$

The difference in the XP values of the two groups analysed is 11.048.

The results that we obtained using the White's test allowed us to validate Hypothesis 5a, thus confirming the existence of a linear positive relationship between export performance (export intensity) and a firm's degree of geographic diversification. A high GDI is thus associated with higher levels of export intensity, which means greater dependency on foreign markets. This positive relationship, which we identified for a sample of Spanish exporting companies, has been conclusively corroborated by previous research on internationalisation (Alonso & Donoso, 1998; Chao et al., 2012; Lee & Yang, 1990; Navarro, 2002). In keeping with other studies, our research also does not receive support to inverted U-shape (Chao et al., 2012).

²⁰ The underlying idea of this test is to determine whether the evolution of explanatory variables, their variances and their covariances is significant to obtain the sampling error variance value, with that variance being deemed an estimate of random perturbation variance.

5. Conclusions and discussion

Our empirical analysis has allowed us to obtain a model that, on the one hand, brings together a wide variety of variables that explain firms' export behaviour based on the export market expansion approach adopted and the distinguishing characteristics thereof and, on the other hand, addresses the link between this strategy and export success.

The quality of our first model's goodness of fit reflects the importance that certain situation-related factors acquire in terms of the adoption of a given export market expansion strategy, which provides an answer to the first question that we posed on the ways in which exporting companies with a greater tendency to diversify their export sales differ from those that follow the alternative type of approach.

Broadly speaking, we can conclude that international commitment, firm size, firm age and level of foreign ownership in share capital are the factors that have the greatest influence on an organisation's choice of export market expansion approach, although investment in innovation, the sector involved and expenditures on communication activities as a percentage of sales all have a bearing as well.

We have found that the export behaviour of international diversity for larger SMEs and large firms is different from that of small firms. Hence, our results confirm for both medium-sized and large enterprises are more likely to adopt a greater degree of geographic diversification than small companies. Resources differ depending on firm size. On the one hand, high levels of international diversification increase the costs related to the need to adapt to the cultures of different countries, leading to greater problems in terms of managerial resources for most small firms. On the other hand, though these results contradict the traditional belief that larger firms have a stronger tendency to diversify (confirmed by the majority of empirical research), it is also true that not all firm sizes are included in these studies (or are analysed primarily on a sample of SMEs or on large firms). Our result could lead us to ask, as noted earlier in this paper, whether a more operational flexibility, faster reaction to market changes and a smaller coordination cost of SMEs versus large enterprises (which are characterised as having more resources, a greater capacity to take risks and more wide-ranging and intensive commercial activity) supposes no differences between medium-sized and large firms in adopting a greater geographic diversity.

In keeping with other studies, we have found the origin of a firm's share capital to be a relevant predictor of greater export market diversification in that the likelihood of a firm diversifying increases as the level of foreign ownership in its share capital does likewise.

Our results show that investment in innovation influences a firm's export market expansion approach, with there being a greater likelihood of an export market diversification being followed in firms with a more active role in R&D. In the sense that R&D is linked to high-technology industries, firms are more likely to diversify if their industry's technological intensity is at a more advanced level.

Our results corroborate others obtained in recent studies. As noted at the beginning of this paper, firms that tend to specialise (whose activity is in intensive R&D industries) prioritise export market diversification because the potential market is more limited and innovators have to enter various markets simultaneously to reap the first mover advantage and deter imitators.

In our model, foreign subsidiaries, which entail a greater degree of international commitment (FDI), is also a determining factor in that it involves a greater propensity for export market diversification than entry modes requiring less commitment. Consequently, an increasing number of foreign subsidiaries raise the firm's degree of export dispersion.

Our results confirm that the effort required by advertising is a factor that influences a firm's choice of international expansion strategy, although this effect was contrary to the positive relationship established.

With regard to the model that we proposed for our second question, concerning how the firm's international diversification is related to their export success, we examined how behaves this relationship based on the past literature, particularly dealing with different conflicting approaches (linear positive, linear negative, no relation, inverted U-shaped and S-curve). Our research corroborates the existence of a positive relationship in that a high geographic diversification index entails better export performance and, thus, greater levels of internationalisation. However, the curvilinear relationship between international diversification and firm export performance does not receive support.

Additionally, our estimated model incorporates two structures depending on the differences in the export behaviour of the firms analysed. According to these structures, firms that adopt an approach with a tendency towards greater export market diversification will have a greater effect on export intensity. Whereas export intensity reflects the relative commitment to exporting versus domestic sales, geographic export diversification stands for the presence in different markets or world regions at a given level of export intensity. Higher commitment to export markets and greater geographic diversification reflects a higher intention to allot R&D and financial resources to the export activity.

Finally, the following practical implications may be derived from our study, especially for managers running manufacturing firms in Spain and other economies with a similar level of development.

Based on the data used and the analyses carried out, exporting companies with a greater degree of diversification in terms of export sales have a profile associated with a medium or large firm size, a greater age, a more technologically advanced economic activity and a greater level of foreign ownership in share capital. Those intrinsic characteristics could therefore condition the choice of one type of approach or the other of export market expansion. However, it is also the case that a greater tendency towards internationalisation measures, such as taking an active approach to marketing in foreign markets and following a more active R&D policy for product innovation purposes (choices

representative of a higher level of competitiveness), has a bearing on firms adopting a greater degree of diversity in their geographic expansion.

Thus, adopting an international diversification strategy appears to be a good option, according to the findings of this study. Our study suggests that how firms deploy their marketing efforts and innovation capabilities determines whether international diversification is a viable strategy with positive export performance outcomes. In turn, companies (mainly small firms) should find the additional resources they need with the involvement of other foreign partners in its share capital. We therefore suggest that exporter firms focus more closely on the aforementioned factors because greater diversification is associated with better export performance.

5.1. Limitations and scope for future research

In carrying out this research, we have attempted to further our understanding of a specific aspect of firms' internationalisation. We are conscious, however, of the study's limitations, which should be the basis for new lines of future research geared towards overcoming them.

First, one limitation consists of not using an *ad hoc* data compilation technique, exemplified by the survey itself (primary source). We have worked on the basis of secondary data collected from a panel of firms for multiple purposes rather than solely for our goals. Despite the advantage of the sample's representativeness, given its broad scope and its high levels of quality and validity, doing so has prevented us from obtaining specific information on certain variables, and from reflecting appraisals or opinions. We have thus been restricted to obtaining results based on the information available.

Second, related to the above, the efficacy of the definition of a firm's export market expansion strategy and the export performance, the main variables of the empirical part of our research, represents a second limitation. Again, the data available have obliged us to establish this in a certain way. There are other (mainly multidimensional) criteria for the same purpose, and they would have enhanced classification, meaning that the results obtained must be treated with due caution. It would be advisable to carry out *ad hoc* research that allows for the collection of information more suited to the variables studied and to compare such research with our work.

Thirdly, since our sample has been limited to the manufacturing sector and a specific country, caution needs to be exercised while generalizing the results. Although the similarities between Spain and other advanced post-industrial countries may be sufficiently strong to make the results more generally applicable, that needs to be empirically verified. We therefore suggest carrying out work that addresses other sectors (e.g. services firms), countries and/or autonomous communities that render the results obtained comparable. It would also be appropriate to carry out a case-by-case study of born-global companies or international new ventures due to their inherent international profile.

Lastly, we must emphasise that this is a cross-sectional study, like most of the literature on internationalisation. The effect of its variables is therefore observed statically, without considering

how such factors might vary over time. Hence, given the considerable amount of time required for making decisions related to internationalisation, it would be interesting to carry out longitudinal studies with scope for reflecting the dynamics of the model's variables.

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Figure 1. Conceptual framework

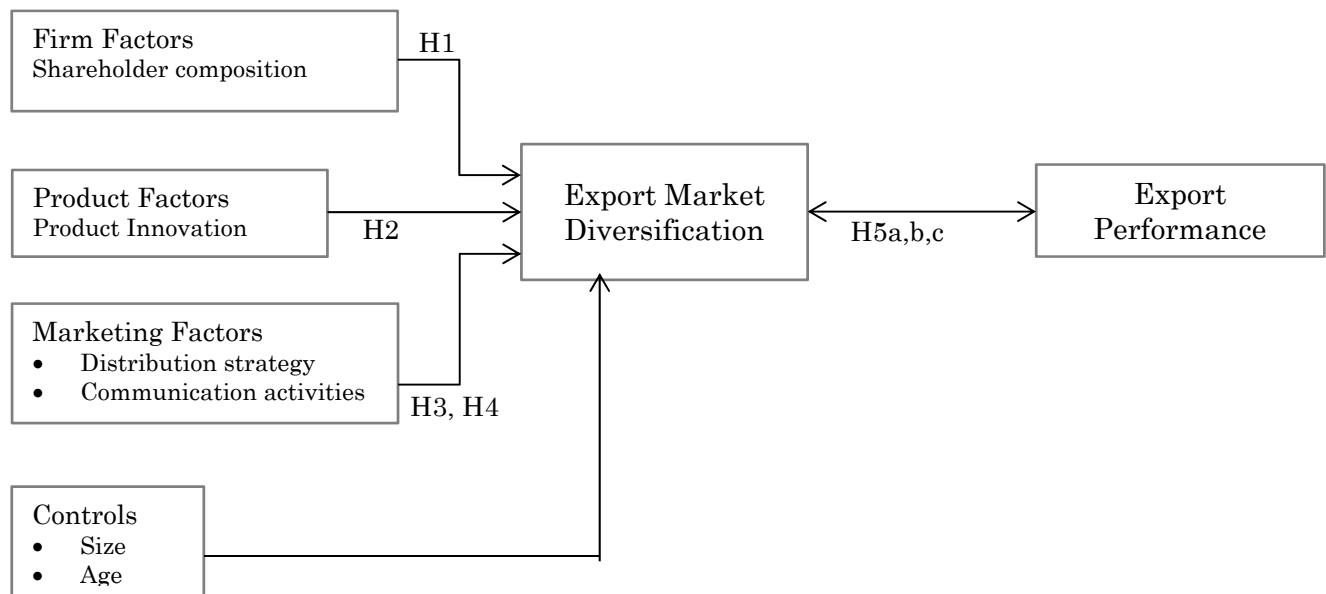


Table 1. Descriptive analysis of sample (first model's independent and control variables)

| Variable | % firms | | Chi-square / F Snedecor |
|--|-----------------|--------------|----------------------------|
| | GDI \leq mean | GDI $>$ mean | |
| Size (number of employees) (<i>Recommendation 2003/361/EC</i>) | | | 77.80*** (χ^2) |
| Small (≥ 10 and < 50 employees) | 44.86 | 22.10 | |
| Medium (≥ 50 and < 250 employees) | 35.65 | 46.24 | |
| Large (≥ 249 employees) | 19.49 | 31.66 | |
| Age (number of years) | | | |
| <i>Mean (number years)</i> | 29.82 | 34.52 | 15.64*** (F) |
| Foreign ownership ^a | | | |
| <i>Mean (% participation)</i> | 14.07 | 29.19 | 47.66*** (F) |
| R&D Investment | | | |
| <i>Mean (R&D/sales) (%)</i> | 0.87 | 1.58 | 18.18*** (F) |
| Number Foreign subsidiaries | | | |
| <i>Mean (number)</i> | 0.41 | 1.20 | 14.42*** (F) |
| Advertising Intensity | | | |
| <i>Mean (Advertising expenditure/ sales) (%)</i> | 1.43 | 1.14 | 2.97 [†] (F) |

N=1,300. ***p < 0.001, **p < 0.01, *p < 0.05, [†]p < 0.1.

^aIn that year, the percentage of total sample firms with foreign ownership is 23.8%.

Source: Prepared by authors with ESEE-2009 data (Spanish exporting companies)

Table 2. Descriptive statistics and correlation matrix (first model)

| Variables | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--------------------------------|-------|-------|---------------------|----------|----------|--------|----------|---------|-------|
| 1. Binary GDI | 0.49 | 0.50 | 1.000 | | | | | | |
| 2. Size | 1.92 | 0.76 | 0.228*** | 1.000 | | | | | |
| 3. Age | 32.13 | 21.50 | 0.109*** | 0.201*** | 1.000 | | | | |
| 4. Foreign ownership | 21.49 | 40.18 | 0.188*** | 0.375*** | 0.134*** | 1.000 | | | |
| 5. R&D Investment | 1.22 | 3.04 | 0.118*** | 0.108*** | 0.019 | -0.023 | 1.000 | | |
| 6. Number Foreign subsidiaries | 0.80 | 3.80 | 0.105*** | 0.210*** | 0.144*** | 0.064* | 0.094*** | 1.000 | |
| 7. Advertising Intensity | 1.28 | 3.01 | -0.048 [†] | 0.120*** | 0.199*** | -0.007 | 0.026 | 0.081** | 1.000 |

N=1,300. ***p <0.001, **p <0.01, *p <0.05, [†]p<0.1.

Binary GDI: GDI ≤ mean = 0; GDI > mean = 1; Size: Small firm = 1; Medium firm = 2; Large firm = 3.

Table 3. Determinants of export market diversification. Regression results

| Variables | | Binomial logistic | | | | | | Multiple regression |
|---|--------------------------------|---------------------|-----------------|---------------------|-----------------|---------------------|-----------------|-------------------------------------|
| | | Model 1 | | Model 2 | | Model 3 | | Model 4 |
| | | β Coefficient | Exp (β) | β Coefficient | Exp (β) | β Coefficient | Exp (β) | β Coefficient |
| H1 | Foreign ownership | | | 0.010*** (0.001) | 1.010 | 0.007*** (0.002) | 1.007 | 0.001*** (0.000) |
| H2 | R&D Investment | | | 0.085*** (0.024) | 1.089 | 0.074*** (0.023) | 1.077 | 0.010*** (0.002) |
| H3 | Number foreign subsidiaries | | | 0.124*** (0.034) | 1.131 | 0.083** (0.033) | 1.087 | 0.006*** (0.002) |
| H4 | Advertising Intensity | | | -0.050* (0.021) | 0.951 | -0.064** (0.021) | 0.938 | -0.006** (0.002) |
| <i>Control variables</i> | | | | | | | | |
| | Size | | | | | | | |
| | Small (reference category) | | | | | | | |
| | Medium | 0.927*** (0.136) | 2.528 | | | 0.759*** (0.140) | 2.136 | 0.099*** (0.015) |
| | Large | 1.129*** (0.155) | 3.092 | | | 0.756*** (0.174) | 2.131 | 0.096*** (0.019) |
| | Age | 0.006* (0.003) | 1.006 | | | 0.006* (0.003) | 1.006 | 0.001** (0.000) |
| | Constant | -0.911 | | -0.352 | | -0.953 | | 0.232 |
| | -2 Log likelihood | 1,717.364 | | 1,711.292 | | 1,669.353 | | |
| | Predictive capacity (per cent) | 61% | | 64.15% | | 64.46% | | |
| | χ^2 | 84.376*** | | 90.447*** | | 132.387*** | | 24.020*** (F) |
| | Nagelkerke R ² | 0.084 | | 0.090 | | 0.129 | | 0.110 (Adjusted R ²) |
| <i>Depent variable</i> | | | | | | | | |
| Binary GDI (0 = GDI \leq mean (reference category); 1 = GDI > mean) | | | | | | | | GDI |

N=1,300. ***p <0.001, **p <0.01, *p <0.05, †p<0.1. Standard errors in parentheses.

Table 4. Regression results (White test estimation)

| Dependent Variable: XP | |
|--|----------------------|
| Method: Least Squares | |
| Included observations: 1.300 | |
| White heteroscedasticity-consistent standard errors & covariance | |
| Variable | Linear |
| Constant | 2.608** (1.019) |
| GDI | 67.880*** (3.818) |
| BGDI | 11.048*** (2.097) |
| R-squared | 0.557 |
| Adjusted R-squared | 0.557 |
| S.E. of regression | 19.157 |
| F-statistic | 541.910*** |
| Mean Dependent var. | 31.687 |
| S.D. dependent var. | 28.737 |
| Durbin-Watson stat. | 2.036 |

N=1,300. ***p <0.001, **p <0.01, *p <0.05, †p<0.1; standard error in parenthesis.